

CLAIMS

1. A solid state image pickup device having an image pickup region comprised of a plurality of photo-sensors and a transfer register for transferring signal charges accumulated in said photo-sensors, said image pickup region formed on the face layer side of a substrate, wherein said solid state image pickup device further comprises

an impurity region portion formed continuously in a direction orthogonal to the transfer direction of said transfer register, said impurity region portion provided at a position corresponding to a position between said photo-sensors adjacent to each other along the transfer direction of said transfer register in said substrate.

2. The solid state image pickup device as set forth in claim 1, wherein

said impurity region portion is formed at a position deeper than said transfer register as viewed from the face layer portion side of said substrate.

3. The solid state image pickup device as set forth in claim 1, wherein

a plurality of said impurity region portions are formed in the depth direction of said substrate.

4. The solid state image pickup device as set

forth in claim 1, wherein

separately from said impurity region portion, a channel stop region portion comprised of an impurity region is formed between said photo-sensors adjacent to each other along the transfer direction of said transfer register and in the vicinity of the surface of said substrate.

5. The solid state image pickup device as set forth in claim 1, further comprising

an overflow barrier formed in said substrate on the deep layer portion side relative to said photo-sensors and said transfer register, wherein

said overflow barrier is in a projected and recessed shape at an interface thereof in the depth direction of said substrate, and a projected portion of said projected and recessed shape is disposed at a position corresponding to a position between said photo-sensors.

6. The solid state image pickup device as set forth in claim 1, wherein

in addition to said impurity region portion, a first barrier region portion comprised of an impurity region is provided at a position between said photo-sensors adjacent to each other in the transfer direction

of said transfer register and shallower relative to said impurity region portion as viewed from the face layer portion side of said substrate.

7. The solid state image pickup device as set forth in claim 1, further comprising

a second barrier layer comprised of an impurity region portion formed along said transfer register.

8. The solid state image pickup device as set forth in claim 7, further comprising

an overflow barrier formed in said substrate on the deep layer portion side relative to said photo-sensors and said transfer register, wherein

said overflow barrier is in a projected and recessed shape at an interface of said photo-sensors and said transfer register side in the depth direction of said substrate, and a projected portion of said projected and recessed shape is disposed at a position corresponding to a position between said photo-sensors.

9. The solid state image pickup device as set forth in claim 5, wherein

said impurity region portion is higher than said overflow barrier in impurity concentration.

10. The solid state image pickup device as set forth in claim 8, wherein

said impurity region portion is higher than said overflow barrier in impurity concentration.

11. The solid state image pickup device as set forth in claim 7, wherein

said impurity region portion and said second barrier region portion are located at the same depth as viewed from the face layer portion side of said substrate.

12. A solid state image pickup device having an image pickup region comprised of a plurality of photo-sensors and a transfer register for transferring signal charges accumulated in said photo-sensors, said image pickup region formed on the face layer portion side of a substrate, wherein said solid image pickup device further comprises

an impurity region portion formed in said substrate continuously with a position between said photo-sensors adjacent to each other in the transfer direction of said transfer register.

13. The solid state image pickup device as set forth in claim 12, wherein

said impurity region portion is formed at a position deeper than said transfer register as viewed from the face layer portion side of said substrate.

14. The solid state image pickup device as set

forth in claim 12, further comprising

a second barrier region portion comprised of an impurity region formed along said transfer register.

15. A method of manufacturing a solid state image pickup device, comprising the steps of:

forming on the face layer portion side of a substrate a plurality of photo-sensors and a transfer register for transferring signal charges accumulated in said photo-sensors; and

forming an impurity region portion continuously in said substrate at a position between said photo-sensors adjacent to each other along the transfer direction of said transfer register.

16. The method of manufacturing a solid state image pickup device as set forth in claim 15, wherein

said impurity region portion is formed at a position deeper than said transfer register as viewed from the face layer portion side of said substrate.

17. The method of manufacturing a solid state image pickup device as set forth in claim 15, wherein

a plurality of said impurity region portions are formed in the depth direction of said substrate.

18. The method of manufacturing a solid state image pickup device as set forth in claim 15, further

comprising the step of

forming an overflow barrier in said substrate on the deep layer portion side relative to said photo-sensors and said transfer register, wherein

said overflow barrier is in a projected and recessed shape at an interface thereof in the depth direction of said substrate, and a projected portion of said projected and recessed shape is disposed at a position corresponding to a position between said photo-sensors.

19. The method of manufacturing a solid state image pickup device as set forth in claim 15, further comprising the step of

forming a first barrier region portion comprised of an impurity region at a position between said photo-sensors adjacent to each other along the transfer direction of said transfer register and deeper than said impurity region portion as viewed from the face layer portion side of said substrate.

20. The method of manufacturing a solid state image pickup device as set forth in claim 15, further comprising the step of

forming a second barrier region portion comprised of an impurity region along said transfer region.